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COUNTRY: USSR

SUBJECT: Comments on Soviet Article on Traumatic Surgery and Orthopaedics

October 1954

Case - 16482

50X1

PLACE ACQUIRED: 50X1 - - - - - -

DAS - 4180

DATE ACQUIRED:

DATE OF INFO: 1945 AND EARLIER

SOURCE:

50X1

1. Q. How would you evaluate the scientific level and value of the entire procedure described in this abstract of Negovskii's article?

A. The scientific level of the article is certainly below par because in my opinion the author has confused a good resuscitating technique for treating hemorrhagic shock by using it in terminal stages of acute or chronic disease. In addition to this he has failed to recognise a very important emergency, that of cardiac rest.

The procedure itself is very useful in severe hemorrhagic shock states which fail to respond to adequate conventional thera .

As to the historical claims made in the article, Russian scientists were undoubtedly leading pioneers in the use of blood in medicine. The claim that serious arterial transfusion work was done in 1875 invites documentation. It was not until Landsteiner's and Shattuck's discovery of agglutinating and agglutinable substances in blood in 1900 that the practice of transfusions became practicable.

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The intra-arterial method for administration of blood was employed with success by I. A. Birillo, his report appearing in a Soviet journal in 1939. In the US the method was first used by Kohlstaedt and Page the same year.

2. Q. What is your opinion of retrograde intro-arterial transfusion as an heroic life saving procedure?

A. Intra-arterial (retrograde) transfusions have come to be used frequently in resuscitating patients with severe hemorrhagic shock. Its use in non-hemorrhagic shock states, however, has met with such varying results that we tend to prefer the intravenous route of administration.

The principle advantage in intra-arterial blood administration under pressure would seem to be the immediate increment in coronary flow. The time factor in improving coronary flow compared to intravenous administration of blood under pressure is not appreciable in mild and moderate stages of hemorrhagic shock. In extreme hypotension from hemorrhage, however, intra-arterial transfusion seems to be the most effective method of raising the coronary pressure and thus restoring the general circulation.

Intra-arterial transfusion is of specific value in cardiac surgery, if citrate intoxication is prevented.

3. Q. What is your opinion of additives and method of transfusion as outlined in paragraph 1 of the abstract?

A. Regarding the additives mentioned in the article submitted we are unfamiliar with the use of the 3% hydrogen peroxide. The use of glucose is a well established additive to enable storage of blood and its derivatives. The use of 1:1000 adrenalin in the arterial transfusion is definitely questioned. We feel very strongly that the use of adrenalin in the face of myocardial hypoxia can lead to myocardial irritability and fibrillation. Since the arterial route leads directly to the coronary system this practice would seem hazardous in severe shock states.

The method describes apparatus which is in common use in this country, viz., the T-tubing connecting a rubber bulb and manometer to the blood bottle which leads to the patient's artery. The choice of arteries is certainly optional but often means a

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sacrific of the smaller ones. We favor a femoral artery puncture when there is not time for a cut down procedure. The rate of injection, as well as the pressure, is certainly variable, and we agree with the initial low pressure in seeking the patient's needs. Perhpas the more important factor is the volume of blood given. It would seem to be less on the arterial side to establish an acceptable blood pressure, although the 100-200 ml. quoted seems small. Once the blood pressure is established the deficiency in blood volume is corrected more safely on the venous side.

Overtransfusion is an ever present danger in arterial transfusion. We have found in our experimental laboratory that whole blood, equal to 7% of the body weight of normal dogs, if administered in 30 to 60 minutes, caused death in 30% of cases. Animals will survive an overtransfusion of 25% to 35% of normal total blood volume given in 4 to 5 minutes. Overtransfusion fatalities showed that the animals died from acute cardiac failure or from signs of plethora and cerebral damage.

4. Q. What is your opinion of respiratory assistance measures outlined in paragraph 2 of the abstract?

A. Respiratory assistance in severe shock states is vital and should supply oxygen in the most efficient manner. We disagree with the quoted preference of manual artificial respiration over oxygen by mask. If oxygen resuscitation apparatus is at hand, certainly adequate oropharyngeal airways should be included. Intratracheal intubation is certainly the most efficient method if such a measure be warranted. We agree CO_2 in the oxygen supplied is unwarranted. The patient in severe shock already has too much CO_2 in his circulation. The last statement in paragraph two has already been discussed above.

5. Q. How would you evaluate the claims for recovery as stipulated in paragraph 3 of the abstract?

A. We can only agree with the first three indications for arterial transfusion as outlined. The last three indications in our opinion are actually contraindications. In severe toxemia such a procedure is only transitory, and the patient will be no better after the initial response, plus having undergone the possible

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hazards of overtransfusion. In asphyxia or accidental electrocution the problem is not hemorrhagic shock but cardiac fibrillation or arrest. These are the most urgent of emergencies and thoracotomy with appropriate techniques to re-establish the normal heart beat is the only solution (cardiac resuscitation). This heroic measure must be started within 3 minutes of the disappearance of the pulse and blood pressure.

Accepting this criticism the claims for recovery quoted become meaningless. The overall recovery figure of 46% would naturally be low because the method used in contraindicated groups would tend to lower the overall percentage.

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